DVN-I
Automotive Interior

Thu, 23 September 2021 Weekly Newsletter NEWSLETTER #79

Editorial

IAA Mobility: Smart & Sustainable

WEY COFFEE 1 REVEAL AT IAA 2021 (IAA IMAGE)

IAA Mobility in Munich, the first time this venerable auto show has transformed into platform for the mobility of the future, brought together a wide array of transport modes—from cars and bicycles to digital solutions and urban air mobility; from lowered-CO_2 ICE to zero carbon EVs; from components to complete mobility systems. 400,000 participants and 3,500 journalists from 95 countries; 744 exhibitors and 936 speakers from 32 countries took part at the event, presenting and discussing innovations and visions for a climate-neutral mobility of the future. The city of Munich was a wonderful host for the show, combining business in the main trade show place with expanded public access in various city locations.

Sustainability was present at every booth—not only new kinds of vehicles but also new kinds of materials as the building bricks of tomorrow's mobility, and that's the focus of this week's in-depth. Most of this edition of your DVN-I Newsletter is focused on the IAA, including a Design Lounge feature on the new Renault Mégane EV. And our

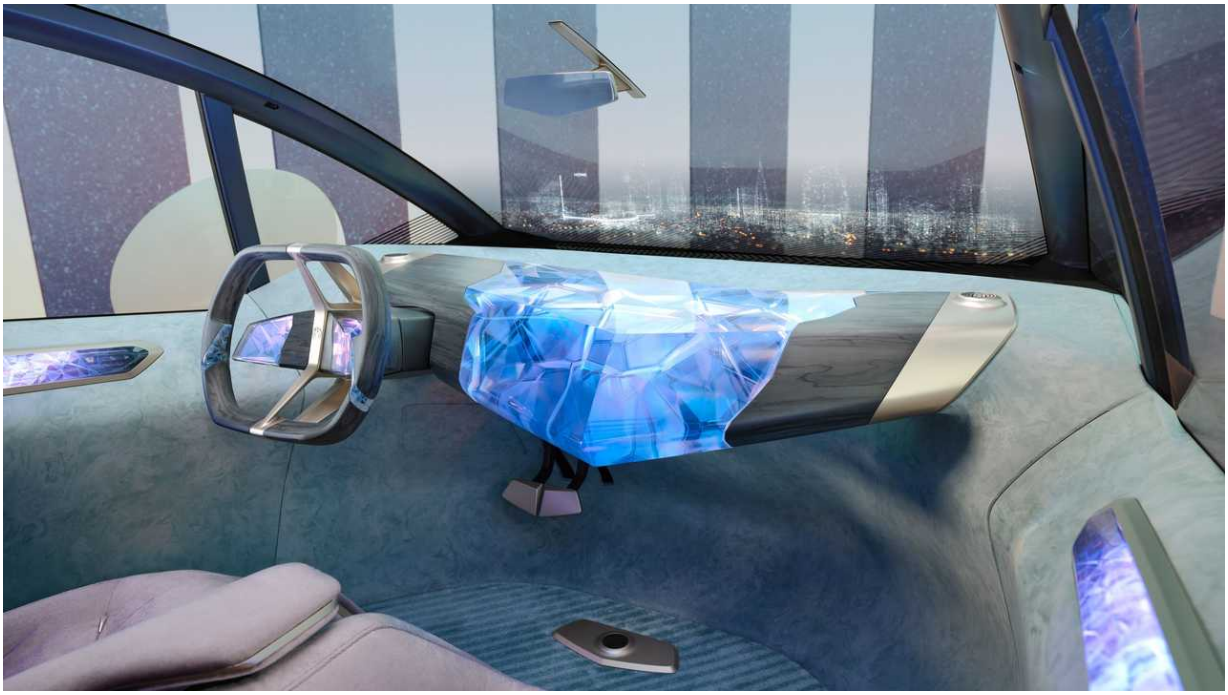
mobility philosopher Industrious is back from summer holiday, sharing his unique perspective on the interiors at the show. The 23rd DVN Workshop took place this past Tuesday-Wednesday near Detroit. It was great event, and we'll report on it next week. As always, we're glad you're here as part of the DVN-I community!

Sincerely yours,

Philippe Aumont
General Editor, DVN-Interior

In Depth Interior Technology

IAA Mobility & Sustainability



3D-PRINTED PANELS WITH GLASS & WOOD EXTEND REARWARD FROM THE IP (BMW IMAGE)

BMW i Vision Circular

BMW presented their i Vision Circular concept car with a 100 per cent recyclable interior. This 4-metre-long EV looks ahead to 2040, when it would be fully made of recycled and recyclable materials.

It's a 4-seater, using a recycled aluminum frame and recycled plastic upholstery. It offers roomy interior space thanks to the overall architecture, with wheels pushed out to the vehicle's corners. Inside, a range of environmentally friendly materials and methods are implemented throughout the design, development and manufacturing processes, including no use of chrome or leather.

BMW design chief Adrian van Hooydonk says the concept shows BMW's ideas for combining sustainability with a new circular-design approach that has a minimal footprint.

Special emphasis is made on recycled material and easy dismantlability of the interior, with smart joining methods. In that respect, composite materials are out. Detachable connections will also enable replacement of individual materials or parts to keep the vehicle up to date.

It also uses a solid-state battery with higher energy density and less rare earths. Tires are produced from sustainably-cultivated rubber.

An entirely digital cockpit will allow over-the-air updates to keep systems current. The instrument display has been conceived to provide occupants a so-called "phygital"

(physical + digital) experience. 3D-printed panels with glass and wood elements extend rearward from the dashboard. The instruments are relocated from behind the steering wheel to an AR-HUD at the base of the windshield; the driver can move the elements in the HUD to suit their preference, via interactive pads mounted on the 3D-printed steering wheel.

BMW I VISION CIRCULAR CONCEPT: SUSTAINABILITY, LUXURY AND COMFORT (BMW IMAGE)

VW ID.Life

VOLKSWAGEN ID.LIFE CONCEPT (VW IMAGE)

VW's ID.Life keeps the design as simple as possible, while also incorporating natural or recycled materials.

The wooden surrounds for the dash panel, windshield, rear seat, and other components are made of FSC (Forest Stewardship Council) certified raw material. The ArtVelours Eco used for the seat surfaces and door trim is made of 71 per cent recycled PET bottles and shredded teeshirts. The stitching used in the purple

decorative seams consists of 100 per cent recycled PET. Shredded tyres serve as the key ingredient for the rubber paint finish that gives the entrance area its distinctive texture.

In other vehicle area, wood chips were used in the paint clear coat. The roof and hood are made of recycled PET bottles. The tires are made of bio-oil, natural rubber, and rice husks.

The ID.Life, like other ID concept vehicles, is part of VW’s "Accelerate" strategy to greatly expand VW's EV lineup.

Porsche Mission R

PORSCHE MISSION R (PORSCHE IMAGE)

The Mission R concept race car combines state-of-the-art technologies and sustainable materials, such as plastics reinforced with natural fibers.

The cabin is protected by a carbon-fiber cage, and a display between the controls on the steering wheel shows relevant data during the race. The monitor above the steering column shows the images from the sideview and rearview cameras. A touch display to the right of the seat can be used to call up the driver's biometric data, amongst others. Numerous other cameras in the interior can be used to provide exciting sequences for a livestream transmission. The safety structure made of carbon fiber composite material combines high protection for the driver with low mass and a distinctive look.

Composites might not be the ultimate sustainable material, but, in racing, they offer advantages of high strength vs weight.

Hyundai Robotaxi

Hyundai presented their all-electric robotaxi, based on the Ioniq 5, and announced their commitment to carbon neutrality by 2045.

They're working toward this goal with innovations in raw materials and eco-friendly processes—an eco-friendlier dye process, for example, and using recycled PET bottles to make certain interior parts. These join strategies in use for five years already, such as increased use of wood fiber, eucalyptus cellulose, and castor oil to improve the sustainability of interior materials without compromising on safety or durability.

In collaboration with Healthy Seas, an outfit working to clean up humanity's mess in the ocean by collecting cast-off fishing nets, Ioniq 5 floor mats will be produced using the regenerated nylon yarn Econyl®, which gives fishing nets and other dangerous marine waste a second useful life.

Continental

Continental presented their sustainable vehicle interior concept, called Ambienc3, in a classic VW Microbus. It's an interior conceived to cater for driving, working, and relaxing, with an upcycling and environmentally friendly theme. Continental used an array of recycled and reclaimed materials while retaining a high-quality, clean æsthetic, and which were also chosen for their functional aspects. Passengers can breathe freely thanks to low-emission, low-pollutant materials. Bright colors and flowing forms have been used to give the interior an inviting, modern feel. "Shy" mode hides control buttons when everything's switched off.

Other interior concepts include light and sound functions to create different moods, and surfaces with self-healing properties and tough resistance to abrasion. Continental’s Staynu ("stay new") technology makes surfaces more resistant to dirt on the driver's seat, for example, to keep it looking newer for longer.

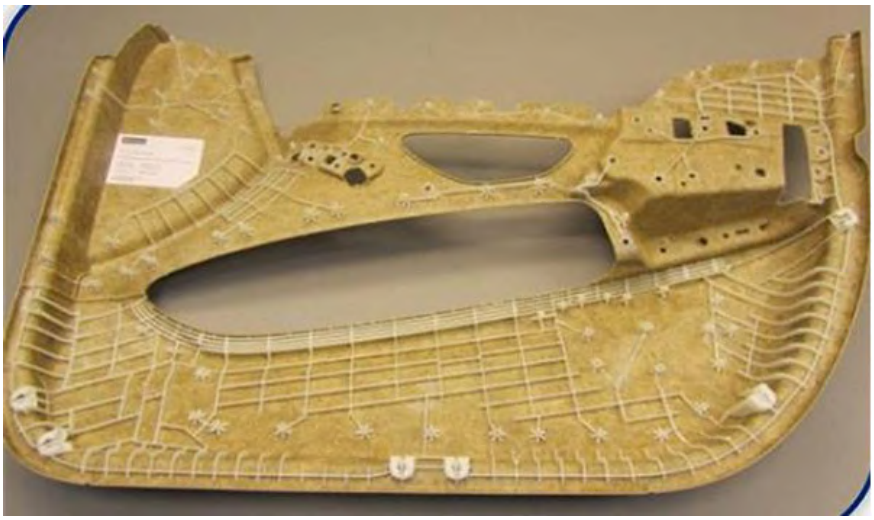
A breathable leather alternative called Laif is used on the interior space and allows air and water vapor to pass through it; drivers and passengers thus benefit from passive temperature control.

Faurecia

FAURECIA'S BOOTH (DVN-I IMAGE)

Faurecia showcased their latest innovations for a sustainable cockpit, zero emissions mobility, and overall progressive CO_2 neutrality.

Sustainable materials—recycled, renewable and bio-sourced—are integrated in instrument panels, center consoles, door panels, and other parts to reduce mass and lower CO_2 emissions.



FAURECIA NAFILEAN DOOR PANEL (FAURECIA IMAGE)

One example is NAFILean Stiff, which this year received an award for its sustainable process. It boasts the best weight/rigidity combination in the market. It's reinforced with 20 per cent hemp fibers, and is 100 per cent recyclable. The biofiber composite NFPP has been further developed using biomass and up to 100 per cent recycled plastic polymers, as well as rCF NFPP, with a layer of 100 per cent recycled carbon fiber.

Faurecia's multi-layer solution combines lighting, thermal elements, surface sensors, controls, and trim within one lightweight structure, with up to 40 per cent weight saving versus a covered ABS door panel insert. It’s an example of sustainability and design flexibility to seamlessly integrate and personalize cockpit functions and features such as radiant panels in the door for individual thermal comfort and energy savings.

FAURECIA'S SEAT FOR THE PLANET (FAURECIA IMAGE)

Faurecia's Seat for the Planet is an innovation program that focuses on using fewer and more sustainable materials for weight saving and CO_2 emissions reduction—including fossil-free steel, already mentioned in previous edition of DVN-I; Ecorium Sense, a new bio-based alternative to leather with premium touch and grain; seat foams made from recycled, recyclable, bio-sourced materials, and low-carbon textiles using recycled PET.

Modular seating headrests, bolsters, cushions, and valances and a new architecture for easy assembly and disassembly facilitates recycling, upgrading, refurbishing, or refitting seating features.

With all these material developments, Faurecia launched a new Sustainable Materials division to scale up their materials innovation and technology transformation with the industry.

Motherson

VEGAN LEATHER DOOR PANEL (MOTHERSON IMAGE)

Motherson Sumi Systems is an Indian supplier of plastic modules and components in Europe and India, and a major manufacturer of wiring harnesses and rearview mirrors. Material selection is an important criterion of their focus to reduce the environmental footprint of parts especially for the luxury car market. Premium surface finish materials present an opportunity for introducing eco-friendly products to the market; for one example of their efforts, they are working with suppliers to assess the suitability of vegan leathers.

Interior News

Valeo’s Health Shield For Traveling Away From Viruses

INTERIOR NEWS

VALEO BOOTH AT IAA MOBILITY 2021 (IAA IMAGE)

IAQ at IAA! Valeo health and well-being technologies presented at the show include interior air quality treatment systems designed to ensure a healthy cabin environment, transforming the vehicle into a sort of “health shield” combining three functions: detection, protection, and information.

Detection involves sensors that quantify the quality of interior and exterior air. They detect fine pollution particles, measuring every second. The sensor automatically activates the recirculated-air mode when particle concentration levels are too high.

For protection, Valeo’s air filters block 96 per cent of allergens and 99.4 per cent of viruses (as certified by the VirHealth), including coronaviruses. With layers of material and a natural coating made up of polyphenols (organic molecules widely found in plants, fruits, and vegetables), they block ultrafine particles, harmful gases, fungi, mould, and certain viral particles. The air in an average-sized car cabin (3 m^3) can be purified in under five minutes by turning on the HVAC.

And then there's information. Valeo’s pollution sensors can inform passengers about air quality in real time on an in-cabin screen or via a smartphone. When several

vehicles are equipped with this technology, they will together form a data community that can map the air quality in urban areas and track its fluctuation.

According to a study by Frost & Sullivan, 56 per cent of consumers in Europe in 2021 wanted an anti-virus air treatment system in their vehicle cabin. Valeo estimates that sales of their interior particle detection technologies could increase sevenfold between now and 2030.

Hyundai Mobis AI-Controlled Concept Car

INTERIOR NEWS

M.VISION X (HYUNDAI MOBIS IMAGE)

At the IAA, Hyundai Mobis, participating in the car show for the first time, showed their M.Vision X artificially intelligent concept car. The 4-seater EV is controlled autonomously as well as via an integrated center cockpit, which communicates with passengers contactless via gesture recognition. According to the company, the M.Vision X offers innovative technology solutions and a novelty for the automotive interior. For example, all windows of the vehicle can be changed into a display with various functions.

The company also presented their current technology components for the new Hyundai Ioniq 5 EV, said to achieve a range of up to 100 kilometers after only five minutes of charging. In addition, Mobis—who, aside from Hyundai and Kia, also supplies components to other major automakers in North America and Asia, presented current developments in areas including advanced HUDs; infotainment; safety and airbag technology; adaptive lighting; high-performance radar; 48-volt systems, hydrogen systems, and chassis innovations.

Mobis is continuously expanding their electrification capacity in Europe (Czechia, Slovakia) and has established new production lines for core electric vehicle parts. In addition, Hyundai Mobis operates a winter test facility in Arjeplog, Sweden.

Antolin's Deco-Surfaces for Vehicle Interiors

INTERIOR NEWS

GRUPO ANTOLIN IMAGE

Interior decoration is a key differentiator, and a relatively easy way to personalize cars. Films are an effective, affordable option for this kind of decoration, among many others Antolin offers, including:

• **IMD, In-Mold Decoration.** This technique consists of a transfer of inks from the film to the part to be decorated during the injection process. The film is a support, it's not part of the deco once the process is finished. It's recommended for parts without aggressive shapes. It needs specific injection tools and equipment.

• **IMF, Insert Molding Forming**. In this case, an insert overholding is previously decorated and thermoformed film by vacuum or high pressure. In this case, the distortions can be more aggressive, and again, it needs specific injection and thermoforming tools. IMF is highly versatile, allowing for partial decoration, different decorations part by part, and additional options such as plastronics, backlighting, and day/night effects.

• **IML, Insert Molding Labelling**. It could be considered as a variant of IMF technology. Its use is indicated for nearly flat decorated parts. Therefore, the pre-injection molding of the decorated film is not necessary.

Grupo Antolin has developed, among other components, a capacitive pad that includes all the functionalities described above.

Fraunhofer IOSB's AI Decides If Driver is Ready to Drive

INTERIOR NEWS

IMAGE: FRAUNHOFER IOSB

For the foreseeable future, automated cars will still need the driver to take manual control from time to time. A new system being developed by Germany's Fraunhofer Institute for Optronics, System Technologies and Image Exploitation is designed to work with cameras in the vehicle's cabin. These could be regular visible-light cameras, infrared night-vision cameras, or depth-sensing 3D cameras.

Live video from the cameras is analyzed in real time by an onboard computer. Artificial intelligence algorithms classify the body poses of the driver and other passengers, and then match those poses up to known activities such as engaging in face-to-face conversation, sleeping, or watching the road. The system can also recognize objects that may be a source of distraction, such as smartphones.

In a situation where the driver needs to take control—such as if the vehicle is approaching a road construction zone—the system alerts them, plus it checks that they're ready to do so. If it's determined that they aren't, the system calculates how long it will take them to return their attention to the road, based on their current activity. It then holds off on relinquishing control, waiting until they're ready.

None of the video footage is recorded, nor is it transmitted outside of the vehicle, so privacy issues shouldn't be a concern.

Once the technology is developed further, it might also be used to recognize hand gestures made by the driver to the car. If they were to say "Park over there" and point in a certain direction, for instance, the system could tell where they were pointing. It could additionally ensure that the driver and all the passengers had fastened their seatbelts, before allowing the car to proceed on its trip.

Sony, Elektrobit Reimagine In-Cabin User Experience

INTERIOR NEWS

ELEKTROBIT'S VISION-S PROTOTYPE (SONY IMAGE)

As Sony continues testing the safety functions in their Vision-S sedan prototype, presented at CES 2020 as a surprise, it remains unclear what they intend to do with the car. Now, Sony and Elektrobit have partnered to transform the cabin into a new entertainment space. Elektrobit is a German software supplier, an independent subsidiary of Continental.

Sony has a lot of content—movies, music and gaming—they want to bring into the vehicle interior space. The hardware to do that includes panoramic screens across the dashboard, Sony's 360 Reality Audio and displays that work together with remote PlayStation connections from home devices, enabled by 5G. All of which Sony says will be high on what they call "adaptability," the prospect of all features being enhanced over time via over-the-air-updates.

Sony and Elektrobit have been working together to develop and refine the user experience, including the infotainment hardware and software, instrument cluster and voice-assistant integrations. Elektrobit's experience in mobile device integration was the key decision criteria for Sony.

The Design Lounge

Renault Mégane E-Tech

THE DESIGN LOUNGE

A highlight of the IAA Mobility show, Renault's debut of the Mégane BEV stood out as it is their first BEV since the Zoe, and gives a glimpse of the Renault brand's future design direction. Based on the same BEV platform as the Nissan Ariya, the Mégane E-Tech has a more voluminous stout exterior presence while also being more carlike than its CUV Ariya sister.

Interestingly, both interior themes and philosophies contrast with their exterior designs. The Ariya is a more elegant and refined execution, while Renault’s Mégane E-Tech uses a blocky, geometric form.

Renault Mégane E-tech

Nissan Ariya

Using a now-established browless instrument cluster design, the E-Tech integrates its two large displays (one being a touch screen), driver-oriented HVAC ducts, and physical metal switches into a single wraparound panel angled and not curved for the driver.

The entire panel seems to float, but not on top like in other makers' designs; instead it floats toward the driver. This execution further separates it from the instrument panel by using a leather or fabric covering. This creates a surface material and haptic contrast to the high-gloss display finish.

Also, the use of a different form and function vocabulary for the driver's and passenger's HVAC ducts contrasts the driver's area from the passenger's in a quite fresh execution.

Finally, by adding another soft trimmed floating element under the centre display for a wireless charger instead of a traditional floor/tunnel console, the front passenger compartment has a more open airy feeling while still prioritizing the driver.

Of note are the headrest designs used on the front seats. Although the seats themselves are blocky, the use of a thin and curved headrest also add to the interior’s airiness.

Detailing in this region is critical for a high-quality impression. Contrast stitching, integrated LED decorative lighting strips, and a full-length HVAC duct for the passenger strengthen this impression.

Renault has also moved to and Android based UX/HMI using Google instead of their previous Tom Tom- based UX/HMI system. Of course, Apple Carplay is also included.

Notice how even the steering wheel has a trapezoidal form factor instead of the traditional round shape. This not only enhances forward visibility but also harmonizes its form with the driver's display panel.

Instrument panel and deco trim surface material/finishes also add to the quality appearance. Notice how the LED metallic ‘blade also aligns with the door panel. This elongates the horizontal elements of the interior space adding to its airiness.

A geometric, blocky seat trim insert adds craftsmanship by using simple, yet not extraverted detailing for the seats.

The rear seat and cargo area are clearly not prioritized for the Mégane E-Tech, but rather downplayed by using simplified forms, materials, yet with clean detailing and execution.

News Mobility

_ Car interiors Unplugged.

NEWS MOBILITY

AUDI GRANDSPHERE (AUDI IMAGE)

an ongoing series portraying automotive interiors as an evolution of our habitat

Opacity

Mapping for Europeans, during the conquest of the Americas, was a central technique of control, result and depiction of an accurate knowledge of the world. Control, for the pursuit of new territories, partly intellectual but also political and tactic. First maps were born as land deals between the two different worlds but also between two different ways of imagining the world. The passionate learning about geography was expressed in function of place but by no means in function of time. We have always mapped what mattered to us. Today's interactive technology adopts mapping into any last-minute mobility trend or just about; in other words, today's mapping is the account of our mobile self.

During this year's IAA, among the dominant trends were lowering emissions, using renewable sources of energy and anything that surrounds the self-driving car. Besides the conversion of any known car-segment to its electric twin (including Mercedes G-class and Porsche's Mission R) as well as forthcoming sustainability scenarios (BMW c circular), there is a sensation that automotive history is about to drift over a fundamental notion: that cars are no longer cars. Thanks to automated driving, our mobile habitat is perfectly embedded into a holistic digital ecosystem, thus the mobile experience is not anymore 'lived' through the framed glass windows but over a screen. Car designers do not design anymore cars but 'the journey'. Equipped with immersive

technology apps, car interiors act as mobile experience converters. In the case of Audi ‘Grandsphere’, the show car reshapes premium mobility so much that the outside reality can be dissociated by the interior events. The experience-device/showcar is proposed as the game changer by the German powerhouse, soon enabling new automotive morphologies.

The pandemic amplifier has recently made this more obvious: confined spaces with screens relaying to any mapped activity as a means to register, observe and generate mobility. Mobility and mapping are correlated like never before, crucial for the endeavor to define the new confined world that raises borders through anything moving. Anything mobile became the new territory to map and conquer. At the attempt to define, in a blind lockdown, the world according to what mattered to us, we amplified the ‘view’ to this world through screens with several depictions of proximity points of interest.

The prospect of mobility has been coupled by a map on a screen. Screen in our house and a screen in our car or our pocket. The more the vehicles and the moving objects on the road the more the screens and the interactive maps. 21st century mobility was even pronounced for a moment with less transparency on car bodies (utility delivery vehicles during lockdown) yet more visibility through screens. In the case of Audi’s vision to the future, ¾ rear- and rear-view angles are not as relevant, opening new envelopes of car body expression, contrasting evermore what is transparent with what’s not.

It might be that the archetype of mobility is ever-changing through this notion: mobility through a screen versus more interior experiences, utility volume and habitat. Similarly, this odd relation between static and mobile changed forever our perception of moving landscapes. Unlike to early European maps we can now change the awareness of space-and-time and we can switch mobility particles of various composition modes.

Imagine yourself as a car designer in front of a canvas of multiple scenarios ready to create your next lineup of future vehicles. Emerging mobile silhouettes, inter-winded next to the classic ones in a mobility utopia where surrounding urban space is sensed and observed through a screen while mapped according to needs and pre-dialed ‘pins’ of importance. Instead of looking out, looking in. A somewhat ‘blind’ vehicle that amplifies the perception(s) of surroundings within its interior and its trajectory defined through screens, somewhat like an “urban submarine”.

The dialectical relationship between form and content is about to change, setting off a new historic mobility segregation, possibly, between the vehicle and its surroundings, redefining transparency and opacity as relative as perceived.

_to be continued…

_____*INDUSTRIOUS__*

Hyundai Robotaxi in Service With Lyft

NEWS MOBILITY

Hyundai unveiled at IAA their L^4 robotaxi, developed with Boston-based Motional. This is the car that will start transporting passengers in 2023 on the Lyft network; it's a high-tech version of the Hyundai Ioniq 5 EV with more than 30 sensors to give a 360-degree, high-resolution view of the vehicle’s surroundings.

This electric CUV's self-driving capabilities were developed with redundancies across every function, including the navigation, steering, braking, and power. It's enabled by the brace of sensors bolted to the vehicle’s exterior, including cameras, radars and lidar, delivering a round-view, high-resolution, ultra-long-range view for safe autonomous driving. All these sensors are very visible, which at this stage is important to convince users, and relieve AV anxiety.

Motional says they will also be able to provide remote vehicle assistance in case of any unforeseen obstacles, such as road construction or flooding. In such instances, a remote operator can connect to the vehicle and redirect it.

Meanwhile, the interior is designed to be passenger-focused for ride-hailing customers.

General News

Webasto Portfolio At IAA: Panoramic Roof And More

GENERAL NEWS

WEBASTO IMAGE

Webasto presented a show car at IAA Mobility without side doors, that drives autonomously and electrically and is intended to demonstrate Webasto's competencies: the roof with integrated sensors for autonomous driving, an efficient heating system, and the traction battery—all from Webasto.

The company, with headquarters in Stockdorf near Munich, is named for company founder **W**ilh**e**lm **Ba**ier **Sto**ckdorf. They're primarily known for sunroofs and convertible roofs, but also engine-independent cabin heaters and batteries. Founded in 1901, they're one of the 100 largest automotive suppliers in the world.

In their Roof Sensor Module, sensors for autonomous driving are integrated in a panoramic roof made of transparent polycarbonate. Polycarbonate is lighter and more impact-resistant than glass, and easily moldable and particularly permeable to a variety of sensor beams. The lidar generates a dynamic three-dimensional image of the surroundings, while cameras enable object recognition and show traffic signs or road markings. To ensure that the sensors function in all weather conditions and when dirty, Webasto uses a thermal management system and various cleaning systems.

In addition, the show car had the HVH high-voltage heater developed by Webasto, an electric water heating system for vehicles with high-voltage electrical systems. The compact device is designed to heat the vehicle interior quickly, constantly and reliably.

It works with an efficiency of up to 99 per cent, and Webasto says it is the only heater available on the market that can be used flexibly in the voltage range up to 800 V.

In addition to the show car, Webasto presented their own battery—to be produced in Dangjin, Ko rea in cooperation with Hyundai-Kia—and a DC wall box for bidirectional charging.

Magna Product Portfolio At IAA

GENERAL NEWS

2021 MAGNA IAA BOOTH

Magna's goodies included a battery enclosure to bolster the structural and safety aspects of an electric vehicle, while protecting high-voltage batteries from damage and water. Lighting technologies such as the Magna Flecsform were on display as well.

MAGNA FREEFORM SEAT (DVN-I IMAGE)

Reconfigurable seating concepts allow for vehicle cabins to be reshaped and reimagined for various levels of autonomy. FreeForm seat trim technology was also presented, using offline prepared A surface panels attached to foam with Velcro—no bonding, to protect thermal comfort.

The company displayed their eDrive technologies which allow vehicles to maximize performance while treading lighter on planet Earth:

• **Reach™ powertrain system**, which, with an intelligent electrified powertrain the system offers an extended range;

• **EtelligentReach,** a fully electric drive solution for compact to large-size vehicles with two electric drive systems for maximum driving performance and energy efficiency;

• **Decoupling+** function, inverters with silicon carbide technology, and a boost function for a short-time increase of drive power (e.g. overtaking maneuvers), it is unique and helps increase range without compromising driving dynamics and safety;

• **Etelligent Eco**, which reduces greenhouse gas emissions by 38 per cent and provides outstanding drivability in purely electric driving, and **Etelligent Force** powertrain featuring the **eBeam** technology, one of the first outcomes from the Magna Joint Venture partnership with LG Electronics, and

• **Icon Digital Radar**, set to launch in 2022, improves performance over today's analog radar.